STACK MEMORY PROTECTION

ABSTRACT OF THE DISCLOSURE

A method and system for memory page protection wherein new stack memory load/ store instructions are defined for memory management. A corresponding operating system and compiler utilize these new stack memory load/store instructions. Whenever it is desired to have a block of memory used as a stack memory, the stack memory load/store instructions are used. A stack memory attribute is stored in a page table associated with the block of memory. Memory blocks having a stack memory attribute may be read and written into using only stack memory load/store instructions. If a normal load/store is attempted to a memory block having a stack memory attribute a error condition is indicated. Likewise a stack memory load/store to a block of memory not have a stack memory attribute will cause a error condition. Stack memory load/stores meant for one type of stack memory (e.g., program stack attribute) will also cause a fault if the stack load/store is attempted to another type of stack memory (e.g., processor stack). Stack memory (processor stacks), transparent to a programmer writing code for a processor employing stack memory attributes, would have a processor stack attributes assigned by the processor or CPU. Using this method and system, stack memory may be assigned anywhere in memory without creating wasted protected pages or having data corrupted by stack memory overruns

or under runs. The operating system no longer needs to allocate specific space in memory as stack memory and likewise does not have to estimate how much memory will be needed for program stacks and processor stacks (e.g.IA64 register stacks).

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